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1. EFFECT OF *IN-SITU* MOISTURE CONSERVATION ON PLANT GROWTH AND NUTRIENT UPTAKE IN AONLA (*Emblica officinalis Gaertn*) IN SLOPPY DEGRADED LANDS

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ABSTRACT: A field experiment was conducted in Krishi Vigyan Kendra, Deendayal Research Institute, Satna for two consecutive years to evaluate the effect of various in- situ moisture conservation measures on establishment and growth of aonla in sloppy degraded lands. In-situ moisture conservation measures included for the study were preparation of circular ring basin + mulching the basin with black polythene, staggered contour trenching 45 cm width and 3 m length) on upper side of the plant basin, placement of one submerged pitcher in one side of the plant for rainwater harvesting, setting the seedling in a depression of 1 m width and 15 cm deep, surrounded by a ring-shaped ridge with 25 cm width and 15 cm height and a 30 cm opening on the higher side to harvest rain water + filling the depression with straw + mulching with black polythene and control (no micro- catchment or mulch). The data on growth parameters (scion shoot length and diameter; number of branchlet, number of leaves, leaf area, fresh and dry weight of shoots and roots) and nutrient content of leaves of budlings under the five treatments were recorded. The results revealed that planting one month old polythene raised seedlings in a pit depression of 1 m width and 15 cm deep, surrounded by a ring-shaped ridge with 25 cm width and 15 cm height and a 30 cm opening on the higher side to harvest rain water and filling the depression with straw and covering the pit with black polythene and performing patch budding next year during end of June, which resulted in maximum budling growth, and nutrients uptake observed to be the best in situ moisture conservation method and may be recommended for rehabilitation of degraded sloppy lands.

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2. RESPONSE OF CAULIFLOWER GROWTH AND DEVELOPMENT UNDER WATER SCARCITY CONDITIONS IN TEMPERATE ZONE

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ABSTRACT : The study was carried out at the College of Forestry & Hill Agriculture, Hill Campus, Ranichauri, Uttarakhand. Soil moisture content was measured using gravimetric method periodically in 0-15, 15-30, 30-45 and 45-60 cm soil profiles. Field experiments were conducted on cauliflower (*Brassica oleracea*) crop during 2007-08 and 2008-09. The crop was transplanted in October and harvested in February spanning 100 and 99 days, respectively. Four irrigation treatments were maintained based on the maximum allowable depletion (MAD) of available soil water. The treatments were 15% (T₁), 30% (T₂), 45% (T₃) and 60% (T₄) maximum allowable depletion of available soil water. No water stress was maintained at the initial stages of the crop development in order to allow the plants attain a healthy growth. Results revealed that irrigation schedule with 45% maximum allowable depletion of available soil water gave the maximum water use efficiency for cauliflower crop. It was found that for scheduling of irrigation for cauliflower crop 0-30 cm soil profile should be considered as most of the water was found to be extracted from this layer by the plant..

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3. PRODUCTION AND MARKETING OF MUSHROOM IN KANPUR NAGAR DISTRICT OF UTTAR PRADESH

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ABSTRACT: The present study was conducted in Kanpur Nagar district of Uttar pradesh with 60 mushroom growers selected from five villages and categorized as small, medium and large based on wheat straw used by them mainly to study the marketing practices and channels involved in the marketing of mushroom and to estimate the selecting costs, margins and price spread. The study reveals that women co-operative society was the most important agency in

the marketing of mushroom. Average quantity sold on perform basis was 6.17 quintals. Half of the producer – sellers preferred to sell mushroom in 1 to 2 quintals size plot. Mushroom quantity (about 66 per cent) of mushroom was sold within the village by majority of producer-sellers (about 70 per cent). Three channels were identified in the marketing of mushroom. Producer's share in consumer's rupee was the highest (98.53 per cent) in channel-1 (farmer-consumer). Retailer earned to maximum marketing margin (12.89 per cent) in the marketing of mushroom

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4. CHANGES IN BAKING AND SENSORY PROPERTIES OF WHEAT BREAD AND MUFFINS WITH THE ADDITION OF GRAPES

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ABSTRACT: Grape juice residue i.e. peel and seeds were dried in a cabinet drier at 60°C for 5 hours. Dried grape peel and seed powder were utilized in the bread and muffins, which were found to be rich in total phenolic compounds, anthocyanins and ascorbic acid. On addition of grape peel and seed powder to the bread at 2 per cent and 4 per cent in each there was increase in weight, volume, specific volume. The shelf life of bread with grape peel and seed powder was more than control. The appearance, colour, texture and taste of bread and muffins with grape peel and seed powder was more eye appealing than control with higher sensory scores.

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5. EFFECT OF GIBBERELIC ACID ON PERIODICAL CHANGES IN BIO-CHEMICAL COMPOSITION OF BER CV. UMRAN

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ABSTRACT: The present studies aimed at evaluating the effects of varying doses of GA₃ on the bio-chemical changes of ber fruit during development. GA₃ @ 10, 30 and 50 ppm was applied at fruit set stage and then superimposed one month thereafter. The periodical bio-chemical analyses of developing ber fruits revealed that total soluble solids concentration increases maximum during initial stages of fruit development i.e. between interval of 25 to 50 days of GA₃ application while total sugars and ascorbic acid increase and acidity decreases as the fruit reaches maturity i.e. between 75 to 100 days of GA₃ application. The GA₃ 50 ppm dose resulted in maximum expression of acidity, total sugars and ascorbic acid at final harvest of ber. Thus it is implicated that GA₃ application is beneficial in improving flavour and taste of ber.

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6. EFFECT OF IBA CONCENTRATION ON INDUCING ROOTING IN STEM CUTTINGS OF *Thuja compacta* UNDER MIST HOUSE CONDITION

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ABSTRACT: The experiment was carried out in randomized block design at Horticultural Research Centre, Chauras Campus, HNB Garhwal University Srinagar (Garhwal), Uttarakhand, India. Softwood cuttings of *T. compacta* were collected from 3 to 4 year old plants and 15 cm long cuttings with apical portion. The cuttings were treated with 1, 2, 3, 4 and 5g L⁻¹ IBA solutions by quick dip method. Vermicompost was used as the rooting media. The temperature of the vermicompost was 26 ± 2°C. Experiment was conducted in the mist house. Among all the treatments, highest number of root per cutting (19.67) was recorded under 5g L⁻¹ IBA concentration. The maximum length of roots per cutting (9.33 cm) was recorded under 2g L⁻¹ IBA concentration. The maximum diameter of root per cutting (0.20 cm) was observed in 4g L⁻¹ and 5g L⁻¹ IBA concentration. Maximum (82.70%) roots per rooted cutting was observed in 5g L⁻¹ IBA concentration. The minimum (23.67 days) taken to callus formation was noticed in 4g L⁻¹ IBA concentration.

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7. EFFECT OF SOME INDIGENOUS PLANT EXTRACTS ON THE INHIBITION OF EGG HATCHING OF NEMATODE *Meloidogyne Incognita* Chitwood INFESTING MULBERRY

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ABSTRACT: Root knot disease caused by the nematode *Meloidogyne incognita* is one of the major diseases of Mulberry, *Morus* spp. which causes major reduction in yield affecting both quality as well as quantity of leaves and fruits. Plants produce a high diversity of secondary metabolites for self defense and survival in their habitat. Some of the plants are known to be inhibiting the development of the nematodes. The present study was carried out to screen the locally available plants for their nematocidal activity. Twelve plants species were selected and methanol extracts with different concentrations (25, 50, 75 and 100%) of different plants were tested for inhibition of hatching of *M. incognita* egg and juvenile mortality in different durations. The plant extracts of *Neem*, *Clitoria ternatea* and *Passiflora foetida* were recorded to be highly effective for inhibition of hatching of egg and increasing juvenile mortality of *M. incognita*. Which will be immense helpful to reduce the qualitative and quantitative loss of mulberry leaf and fruit with eco-friendly plant extract.

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8. INFLUENCE OF NITROGEN AND PHOSPHORUS FERTILIZERS WITH NITROGEN SOURCES ON FLORAL PARAMETERS OF TUBEROSE (*Polianthes tuberosa* L.)

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ABSTRACT: An experiment was laid out during two consecutive years in Horticulture garden of Chandra Shekhar Azad University of Agriculture and Technology Kanpur. There were three nitrogenous sources viz. urea, ammonium sulphate and calcium ammonium nitrate, four levels of nitrogen viz. 0, 50, 100 and 150 kg/ha and four levels of phosphorus viz. 0, 100, 200 and 300 kg/ha, thus a total of forty treatments were taken. The results showed that emergence of spike under the influence of N sources ranged from 97.27-98.35 and 95.58-97.91 days during first and second year of study. Calcium ammonium nitrate caused 1.08 and 2.33 days earlier spike emergence than urea treatment. Nitrogen applied @ 150kg/ha proved more effective in delaying spike emergence but 300kg/ha phosphorus induced earliest emergence. Length and width of spikes was improved with ammonium sulphate followed by CAN recorded 78.19 and 80.99 cm long and 0.88 and 0.90 cm thick spikes, respectively. Nitrogen applied @ 150 kg/ha caused 78.16 and 81.14 cm length of spike and 0.88 and 0.89 cm thick spikes in first and second year, respectively. Length of rachis was registered 1.45 and 1.65 cm longer under ammonium sulphate. 150 kg nitrogen per hectare maximized length of rachis (26.74, 27.85 cm) whereas, phosphorus @ 300kg/ha revealed maximum (26.26 and 27.38 cm) length of rachis. Number of flower maximum influenced by CAN revealed 39.69 and 40.83 flowers during both years. Nitrogen @ 150kg/ha maximized (40.80 and 41.20) number of flowers. Fertilization with calcium ammonium nitrate exhibited longest blossoming duration. Durability of spike increased consistently with increase in nitrogen levels up to 150/ha dose recording 21.41, 22.39 days duration during both experimental years. Phosphorus @ 200kg prolonged self life by 3.46 and 2.67 days when compared with control registering 20.89 and 22.33 days durability.

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9. EFFECT OF LOW POLY-TUNNEL ON THE GROWTH, YIELD AND HARVESTING SPAN OF SWEET PEPPER

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ABSTRACT: To study the impact of low plastic tunnel on the performance of bell pepper, an experiment was conducted from 2004-05 to 2006-07 at vegetable experimental area, Punjab Agricultural University, Ludhiana. The treatments consisted of transplanting of bell pepper during November under low plastic perforated tunnel, low plastic non perforated tunnel, without protection and February transplanting in open field. The results clearly indicated that early yield (68.7q/ha), total yield (278.2 q/ha), fruit number per plant (18.9), plant height (49.44 cm), fruit girth (33.17 cm) and harvesting span (93 days) were significantly more in low plastic non perforated tunnel as compared to unprotected and February transplanted crops. However average fruit weight was at par in all the treatments.

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10. PERFORMANCE OF CUCUMBER

(*Cucumis sativus* L.) HYBRIDS IN AGRO-CLIMATIC CONDITIONS OF ALLAHABAD

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ABSTRACT: Twenty cucumber hybrids were evaluated for growth, yield and fruit quality traits in Allahabad agroclimic conditions. The study revealed that the hybrid Garima Super recorded highest vine length (249.17 cm), number of branches per vine (11.42), number of male flowers (206.33) and female flowers (29.17) per vine, number of fruits per vine (13.83), fruit weight (168.33 g), fruit length (168.33 cm), fruit diameter (4.03 cm), fruit yield (2.24 kg/ vine and 36.24 t ha⁻¹), TSS (5.50 °Brix), vitamin C content (7.28 mg/100 g) and organoleptic scores for various fruit quality traits while, the lowest days to appearance first male flower (31.92) and female flower (35.83), node number at which first male flower (3.42) and female flower (4.83) appeared and days to first fruit harvest (44.83) were observed in same hybrid. Hybrid Garima Super was found superior based on the overall performance of different cucumber hybrids for growth, yield, quality characters and economic returns for cultivation of cucumber under Allahabad conditions.

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11. VARIETAL REACTION OF ROSE AGAINST BLACK SPOT CAUSED BY *Diplocarpon rosae* Wolf. IN ARUNACHAL PRADESH

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ABSTRACT: Varietal reaction trial was conducted at Instructional farm, Department of Floriculture, College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh during April 2011 to March 2012. Out of the thirty seven rose varieties evaluated under open condition none were found highly resistant or resistant. Three varieties namely Paradise, Shabnam and Pixie were moderately resistant. Eleven varieties namely Angelica Rinae, Atago, Folklore, Granada, Hot Cocoa, Mardigras, Midas Touch, Mrinalini, Revival, Tipus flame and Victor hugo were recorded moderately susceptible. Twelve varieties viz., Baccardi, Claudia Ribond, Charies Mallerier, Crimson Lace, Dr. Pal, Impatient, Madam Duilbourde, Marcopolo, Melody, Rainbow End, Sonia and Sugandha gave susceptible reaction. Eleven varieties viz., Angelique, Christiandior, Gemini, Gladiator, Golden Jubilee, Priyadarsini, Sand, Centaury, R. R. M. Roy, Sweet Promise, Unforgotten and Vale of Cloyd were recorded highly susceptible reaction against black spot of rose incited by *Diplocarpon rosae* Wolf.

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12. EFFECT OF GRADED LEVELS OF NITROGEN ON PRODUCTION OF FLOWER, OIL AND BULB OF TUBEROSE (*Polianthes tuberosa* L.)

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ABSTRACT: A field experiment was conducted to determine the effect of different levels of nitrogen on flowering, essential oil and bulb production in tuberose (*Polianthes tuberosa* L. cv Rajat Rekha). Four treatments of graded level of nitrogen as (N₀=0, N₁=120, N₂= 220 and N₃= 320 kg/ha⁻¹) were evaluated under hot subtropical climatic conditions on loamy soils. Application of graded level of nitrogen significantly increased the number of leaves / clump (20.47%), plant height (37.35%), leaf area (32.86%), spike length (35.25%), number of florets / spike (43.23%) and flower yield / clump (93.03%) in N₃ as compared to control, N₁ and N₂, respectively. Nitrogen application @ 220 kg ha⁻¹ reduced days to flowering (by 13.36%), increased vase life (by 17.57 %), enhanced essential oil (by 0.128 %) and increased total bulb yield (by 66.94%, 34.01%) and 3.97% over control, N₂ and N₃, respectively.

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13. RESPONSE OF ORGANIC MA-

NURES ON GROWTH AND YIELD OF MANGO (*Mangifera indica* L.) CV. DASHEHARI

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ABSTRACT: The present investigation was carried out at Horticulture Research Centre, Patharchatta, G. B. Pant University of Agriculture and Technology, Pantnagar. The experiment was laid out with thirteen treatments and three replication in Randomized Block Design. Maximum tree height was observed with the application of poultry manure 25 kg per tree, whereas, maximum tree girth was recorded with application of *neem* cake 30 kg per tree during both the years. Minimum number of fruits and fruit yield (kg) per tree was recorded in control, while maximum number of fruits and fruit yield (kg) per tree with application of 75 kg vermicompost per tree during both the years. Application of different organic manures on mango trees is useful for improving the growth and yield characteristics.

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14. EFFECT OF DIFFERENT PACKAGING FILMS ON SHELF LIFE AND QUALITY OF PEAR FRUITS UNDER SUPER MARKET CONDITIONS

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ABSTRACT: Pear fruits cv. 'Patharnakh' were harvested at physiological mature stage, packed in paper moulded tray and tightly wrapped with different packaging films viz. Low density polyethylene (LDPE), High density polyethylene (HDPE), and Shrink. The film-packed fruits and control (without film packaging) were stored under super-market conditions i.e. 20-21°C and 85-90% RH and analyzed for various physico-chemical parameters after every 7 days interval. Shrink film proved to be most effective in extending the storage life of pear fruits up to three weeks and maintained superior quality as indicated by lower weight loss, desirable fruit firmness, total soluble solids, total sugars, acidity, and higher organoleptic score..

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15. REVIEW ON BIOLOGICAL CONTROL OF SOIL BORNE FUNGI IN VEGETABLE CROPS

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ABSTRACT : Biological control involves the use of beneficial organism, their gens, and/ or products, such as metabolites, that reduce the negative effect of plant pathogen and promote positive response by the plant. Disease suppression, a mediated by bio-control agents, is the consequences of the interactions between the plant, pathogen and microbial community. Mycoparasitism, spatial and nutrient competition, antibiosis by enzymes and secondary metabolites and induction of plant defense system are typical bio-control action of these fungi. Faster metabolic rates, anti-microbial metabolites and physiological conformation are key factors which chiefly contributes to antagonism. V.A. Mycorrhizae play major role in biological control of plant diseases owing to their capabilities of amelioration crop yields by multiple role as bio-pesticides and plant growth promotion.

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16. EFFECT OF MICRONUTRIENTS AND PLANT GROWTH REGULATORS ON FRUITING OF LITCHI

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ABSTRACT: The present investigation was conducted in the litchi orchard of the Farm Area of R.M.D., College of Ambikapur in the year 2007 to 2009 to assess the effect of micronutrients and growth regulators on fruiting in Litchi cv. Ambika Litchi -1. The application of borax 0.4 per cent resulted in maximum fruit set (41.20%), fruit retention (22.60%), size of fruit (4.10 cm × 3.10 cm), number of fruits per tree (4625), weight of individual fruit (21.05 g) and fruit yield (92.85 kg/tree).

GA₃ 10 ppm also was found effective treatment to increase fruit set, fruit retention and size of fruit. GA₃ 20 ppm produce maximum number of fruit/tree and yield. Interaction between borax 0.4 per cent and GA₃ 20 ppm exhibited in maximum retention of fruit and fruit yield. Maximum fruit cracking of 13 per cent was observed in borax 0.4 per cent..

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17. EFFECT OF IBA AND NAA CONCENTRATIONS ON ROOTING IN STEM CUTTINGS OF NIGHT QUEEN (*Cestrum nocturnum* L) UNDER SUB-TROPICAL VALLEY CONDITIONS

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ABSTRACT: The experiment was carried out in simple randomized block design the different length stem cuttings of *Cestrum nocturnum* were treated with IBA and NAA solutions at 100, 200 and 300 mg L⁻¹ by soaking method. Among all the treatments, number of sprouted cuttings and rooting per cent (76.53), length of the roots/cutting (23.76 cm), fresh weight (6.06 g) and dry weight (1.33 g) of roots were higher in IBA 100 mg L⁻¹. While the maximum length of sprout/cutting (190.00 cm) was in IBA 300 mg L⁻¹ and highest number of roots/cutting (91.00) was recorded in NAA 300 mg L⁻¹ treatment.

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18. PERFORMANCE OF CABBAGE HYBRIDS UNDER RAINFED MID-HILL CONDITIONS OF UTTARAKHAND

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ABSTRACT: The pooled data indicated considerable variation for vegetative characters, amongst which the maximum leaf area (1022.71 cm²) was observed in Varun, while the hybrid T-50 top ranked with respect to number of wrapper leaves (14.98) and plant spread (68.56 cm). Golden Acre, an open pollinated check variety, took minimum number of days to maturity (44 days from transplanting). Best quality and yield parameters viz., the maximum ascorbic acid content (139.53 mg/100 g) and head size (515.05 cm²) were recorded in Blue Diamond and NBH-Arun, respectively, whereas, T-50 measured the maximum head weight (2.106 Kg) and yield (801.19 q/ha).

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19. IMPACT OF MICRONUTRIENT SPRAY ON GROWTH, YIELD AND QUALITY OF TOMATO (*Lycopersicon esculentum* Mill)

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ABSTRACT: The present experiment comprised of five levels of micronutrient and two levels of concentration. The maximum plant height, number of leaves per plant, number of flowers per plant, number of fruits per plant, fruit yield per plot, T.S.S. % and ascorbic acid (mg/100g) were found with the application of T₈ (Boric acid + Zinc sulphate + Copper sulphate @ 250 ppm each). The maximum total sugar (%) was found under T₀ (Control).

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20. EFFECT OF NATURAL AND CHEMICAL FLORAL PRESERVATIVES ON THE VASE LIFE OF *DENDROBIUM* HYBRID SONIA-17

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ABSTRACT: Observations on vase life and bud opening of cut flowers of *Dendrobium* cv. Sonia-17 as influenced by floral preservatives revealed that maximum vase life (37.33 days), flower diameter (8.14 cm), number of florets open at a time (7.30) and longest blooming period were recorded with 75 ppm HQC + 75 ppm AgNO₃ + 2% sucrose.

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